REDACTED – FOR PUBLIC INSPECTION

April 21, 2016

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: ***Special Access for Price Cap Local Exchange Carriers*, WC Docket No. 05-25, *AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, RM-10593**

Dear Ms. Dortch:

I hereby submit this Second Supplemental Reply Declaration on behalf of Level 3 Communications, LLC and Windstream Services, LLC in this proceeding. I am currently serving as an outside consultant to the above-mentioned parties and am a Senior Consultant for a subsidiary of FTI Consulting.

The attached Second Supplemental Reply Declaration contains Highly Confidential Information under the Protective Orders and should not be made publicly available. Parties who are admitted to the Protective Orders can request a copy of the Highly Confidential version of this Declaration by contacting John Nakahata at Harris, Wiltshire & Grannis LLP (JNakahata@hwglaw.com).

Please do not hesitate to contact me at 202-274-4315 if you have any questions regarding this submission.

Sincerely,

Jonathan Baker

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Special Access Rates for Price Cap Local Exchange Carriers	)	WC Docket No. 05-25
	)	
	)	
AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services	)	RM-10593

SECOND SUPPLEMENTAL REPLY DECLARATION OF JONATHAN B. BAKER ON MARKET POWER IN THE PROVISION OF DEDICATED (SPECIAL ACCESS) SERVICES

I. Introduction

1. I have been asked by Level 3 Communications and Windstream to respond to the Supplemental Declaration of Mark Israel, Daniel Rubinfeld and Glenn Woroch submitted in these proceedings on March 24, 2016.[1] For ease of exposition, I will refer to Dr. Israel, Professor Rubinfeld, and Professor Woroch collectively as the "ILEC economists." This declaration supplements the declarations I have previously submitted in this proceeding.[2]

[1] Supplemental Declaration of Mark Israel, Daniel Rubinfeld and Glenn Woroch (March 24, 2016) (attached to Letter from Christopher T. Shenk & Russell Hanser to Marlene H. Dortch, Secretary, FCC, WCC Docket No. 05-25, RM-10593 (March 24, 2016) (ILEC Economists Supp. Reply Decl.).

[2] Declaration of Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services (Jan. 22, 2016) (attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WCC Docket No. 05-25, RM-10593 (Jan. 27, 2016) (Baker Decl.); Reply Declaration of Jonathan B. Baker

2. In my initial declaration in this proceeding, I explained why providers of dedicated services are likely able to exercise market power in most markets for dedicated services provided over a wireline connection to each customer location. I also explained why they would be expected to charge prices above competitive levels unless prevented by regulation.[3] I reached these conclusions through an analysis of the structure of dedicated services markets and showed, through a statistical analysis of the FCC's Special Access Data, that this conclusion is consistent with the relationship between the number of rivals and ILEC retail prices in the data. The data analysis demonstrated that (a) incumbent local exchange carrier (ILEC) retail prices are lower when competitive local exchange carriers (CLECs) compete with them, (b) ILEC retail prices tend to decline as the number of rivals selling dedicated services increases, and (c) the decline in price associated with additional rivals is likely greater than the reported results suggest, because the regression results are likely biased against identifying an inverse relationship between the number of rivals and price.[4]

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on Market Power in the Provision of Dedicated (Special Access) Services (Feb. 17, 2016) (attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WCC Docket No. 05-25, RM-10593 (Feb. 19, 2016) (Baker Reply Decl.); Supplemental Declaration of Jonathan B. Baker on Market Power in the Provision of Dedicated (Special Access) Services (March 1, 2016) (attached to Letter from Jonathan B. Baker to Marlene H. Dortch, Secretary, FCC, WCC Docket No. 05-25, RM-10593 (March 2, 2016) (Baker Supp. Reply Decl.).

[3] Baker Decl. ¶ 51.

[4] Baker Decl. ¶ 8.

3. This declaration explains why the criticisms of my statistical analysis proffered by the ILEC economists in their supplemental declaration do not lead me to question my conclusions about market power and prices in dedicated services markets or my interpretation of the regression results. Section II identifies the primary reason the ILEC economists' criticisms of my interpretation of the regression results I presented are unpersuasive: the ILEC economists interpret the results without accounting for the bias in the data against finding an inverse relationship between the number of rivals and price. As the section explains, that bias accounts for most of the concerns the ILEC economists raise, and, contrary to what the ILEC economists suggest, the direction of the overall bias can be determined. Section III responds to other statistical issues raised by the ILEC economists. Section IV responds to the ILEC economists' defense of their claim that competition from nearby rivals makes dedicated services markets perform competitively regardless of the number of in-building rivals. Section V briefly concludes.

II. Interpreting Regression Results When Coefficients are Biased

4. In the primary specification reported in my initial declaration, all statistically significant coefficients on variables accounting for additional in-building or nearby rivals were negative (regardless of whether or not clustering was employed in estimating standard errors). I also reported or or discussed additional regression results. Some of the additional results

derived from estimating the same specification on subsamples, some came from estimating the same specification on broader samples, some involved varying the way independent variables were measured, and some relied on an alternative specification. In some of these results, one of the coefficients on variables accounting for additional providers (and, occasionally, more than one coefficient) was positive and significant.

5. This empirical analysis shows, among other things, that ILEC prices to end users tend to decline as the number of rivals selling dedicated services increase. The ILEC economists say instead that these results "fall far short of the consistent pattern of negative and statistically significant coefficients that would be required for one to draw a reliable inference of an inverse relationship."[5] The ILEC economists take this view primarily because they do not agree with my conclusion about the likely direction of the bias in the reported results.

6. As I previously explained and will discuss further below, my estimates are likely biased against finding an inverse relationship between the number of rivals and price.[6] That is, the regression coefficients on variables accounting for the incremental number of providers will tend to be upper bound estimates (*e.g.,* less negative than the true values). Because the regression coefficients are upper bound estimates, it is also appropriate to identify an inverse relationship from regression results in

[5] ILEC Economists Supp. Reply Decl. ¶ 5.

[6] Baker Decl. ¶¶ 68-95; Baker Supp. Reply Decl. ¶¶ 18-21.

which most significant coefficients are negative, but an occasional coefficient is positive and statistically significant, when the cumulative effect of rivalry is negative and statistically significant (*i.e.*, when the positive coefficients are not so large in magnitude as to make the cumulative effect inconsistent with an inverse relationship).[7]

7. In most of the regression results reported and discussed in my initial declaration, including the primary specification, the cumulative effect of rivalry from in-building providers is to lower price by a statistically significant amount.[8] Once the bias in the regression results is accounted for, the reported results taken as a whole indicate that the relationship between the number of rivals and price is inverse.[9]

8. The ILEC economists instead interpret the coefficients without accounting for the bias in the data against finding an inverse relationship between the number of rivals and price. They take that approach because they do not expect that the results would be biased in a consistent direction.[10]

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[7] In addition, as discussed *infra* ¶ 30, in these regressions inferences based on estimated cumulative effects are more reliable than inferences based on individual coefficient estimates.

[8] Hence my discussion of statistical significance does not "attempt[] to have it both ways" in interpreting the statistical significance of negative and positive coefficients. ILEC Economists Supp. Reply Decl. ¶ 7.

[9] The ILEC economists also observe that some coefficients that result from estimating a particular specification vary across samples. ILEC Economists Supp. Reply Decl. ¶ 9. That does not call into question whether the relationship is inverse for two reasons: there is no reason to expect the magnitude of the bias to be identical across samples, and the relationship itself may vary across samples.

[10] ILEC Economists Supp. Reply Decl. ¶¶ 42-43.

9. In my initial declaration, I identified six reasons why the estimated coefficients would be biased against finding an inverse relationship. The ILEC economists agree that these factors would each lead to biased results in the direction I claim.[11] But they resist my conclusion about the overall direction of the bias because, they say, I ignore two factors that would generate biases in the opposite direction: endogeneity of entry and missing data. They also suggest that the results of estimating my primary specification on a subsample limited to locations in price cap regions demonstrates that the overall bias is in the opposite direction to what I claim. I discuss these arguments in turn, and explain why none support their view that the direction of the overall bias cannot be determined.

A. Endogeneity of Entry

10. The ILEC economists' entry endogeneity theory is that CLECs are more likely to enter at locations where their costs are low and bandwidth demand is high, such as urban centers and office parks.[12] Were that to occur, prices would be low (because costs are low) and the number of rivals would simultaneously be high (because demand is high).[13] If so, the number of rivals would be inversely related to price even if added rivals do

[11] ILEC Economists Supp. Reply Decl. ¶ 42.

[12] Declaration of Mark Israel, Daniel Rubinfeld and Glenn Woroch ¶ 34 (Feb. 19, 2016) (Attachment A to Reply Comments of AT&T Inc., WC Docket No. 05-25, RM-10593 (Feb. 19, 2016)) (ILEC Economic Reply Comments).

[13] *Id.*

not increase competition, biasing the regression results toward finding an inverse relationship between the number of rivals and price (in the opposite direction of the bias I identified).

11. I responded to this theoretical possibility by explaining why, with the controls I employed in my regression estimates, any such bias is unlikely to be large enough to matter practically to the interpretation of the reported results: the use of location fixed effects based on census tracts would be expected to remove most variation in cost that depends on the distance between the customer and the provider's fiber facilities.[14] In their new declaration, the ILEC economists respond by observing that these fixed effects would also control for variation in demand across census tracts.[15] This is correct, but it does not bear on my conclusion that the control removes an important source of the cost variation that the ILEC economists point to when questioning my conclusion about the direction of the overall bias.[16]

12. In their previous reply, the ILEC economists also suggested that an endogeneity bias is plausible on the ground that buildings with high bandwidth demand would tend to have low prices (because the costs of

[14] Baker Supp. Reply Decl. ¶ 21.

[15] ILEC Economists Supp. Reply Decl. ¶ 46.

[16] The ILEC economists do not contend that location fixed effects would reduce any of the six sources of bias I identified.

serving them are low),[17] yet also tend to be served by multiple providers.[18] I explained in my response that costs of service not controlled for by location fixed effects are unlikely to be correlated with the bandwidth demanded by all the customers in a building, and that even if those costs were correlated with bandwidth, the control variable in my regressions accounting for bandwidth would help account for that correlation.[19]

13. The ILEC economists now rest their case for the importance of an endogeneity bias on costs of service not controlled for by the location fixed effects and not correlated with the bandwidth demanded in a building.[20] As I indicated previously, I agree that these controls do not account for variation within a census tract in building access fees or costs of obtaining rights of way. But that does not mean that these costs generate a noticeable endogeneity bias in my reported results.

14. In order to say that any resulting endogeneity bias would be important practically, the ILEC economists would need to suppose that these remaining costs – variation within a census tract in building access fees and costs of obtaining rights of way – affect ILEC retail prices (the dependent variable in the primary specification and in most of the

[17] ILEC Economic Reply Comments ¶ 34 ("prices in buildings with multiple providers often have zero or low mileage charges" because "buildings in urban centers often do not require lengthy transport circuits").

[18] ILEC Economic Reply Comments ¶ 34 ("[L]arger buildings tend to have more competitive provider connections. But these larger buildings are also more likely to have lower *prices* because, for example, the per-unit price of higher bandwidth services tend to be lower.") (emphasis in original; footnote omitted).

[19] Baker Supp. Reply Decl. ¶ 21.

[20] ILEC Economists Supp. Reply Decl. ¶ 47.

regressions I reported or discussed) conditional on CLEC entry to serve customers in the building. To make that case, they would need to suppose further either (a) that these costs affect CLEC prices conditional on CLEC entry[21] (and that ILEC prices respond to that variation in CLEC prices), or (b) that variation in these costs within a census tract is an important determinant of the number of CLECs serving a given location in that census tract.

15. To make the first case, the ILEC economists would need to suppose that when CLEC entry is feasible, CLEC prices would frequently and significantly vary across customers in different buildings within the same census tract as a result of variation in the costs of serving those buildings. But this supposition is inconsistent with **[BEGIN HIGHLY CONFIDENTIAL]** [redacted]

[21] These costs undoubtedly affect CLEC decisions to serve a building. The issue here is the extent to which they affect a different decision: the prices CLECs charge once they have decided to enter.

[redacted] **[BEGIN HIGHLY CONFIDENTIAL]**[22]

16. To make the alternative case, the ILEC economists would need to suppose that variation across buildings within a census tract in the building access fees and costs of obtaining rights of way required for CLEC entry, when not so high as to make CLEC entry unprofitable, were an important determinant of the number of CLECs serving those buildings.[23] But the number of CLECs serving a building depends primarily on the services and performance that the customers in the building demand.[24] Unlike differences across buildings in what customers demand, differences across buildings within a census tract in the costs of obtaining rights of way and building access fees (conditional on CLEC entry) are unlikely to be large enough to influence the number of CLECs providing service to the building.

[22] The features and types of the services customers choose to purchase from CLECs are likely correlated with the valuation those customers place on dedicated services. (A customer's valuation would be expected to vary with a wide range of factors on which prices may be based, including the bandwidth, reliability and performance of the dedicated services the customer requires, the number of locations it wishes to connect, and the type of services it purchases along with dedicated services.) By pricing according to service features and types, therefore, CLECs are likely able on average to charge more to customers that value dedicated services more, without need for specific knowledge of any individual customer's valuation. In general, the valuation differences across nearby customers are likely far greater than differences in the cost of serving those customers. Hence, CLECs reasonably condition prices on the features and types of services that their customers demand, and generally ignore differences in cost conditional on entry. (CLEC prices also vary with the alternatives available to the customer, such as the number of rivals competing for the customer's business. But variation across customer locations within a census tract in the costs of entry is unlikely to be a major determinant of the number of rivals serving that location, for the reasons indicated *infra* ¶ 16.)

[23] CLECs often must pay building access fees and costs of obtaining rights of way that ILECs, which already serve those buildings, do not pay. Fees and costs associated with deploying last-mile fiber connections that were high enough to make entry unprofitable for one CLEC would generally be expected also to have made entry unprofitable for other CLECs.

[24] *See* ILEC Economic Reply Comments ¶ 34 n. 23. The services and performance demanded are likely correlated with bandwidth, which is controlled for in the regressions.

17. For the above reasons, the possibility of endogeneity bias is unlikely to be important practically when analyzing the relationship between the number of rivals and prices in the FCC's Special Access Data. Thus, this possibility does not call into question my conclusion that the regression results are biased against finding an inverse relationship.

B. Missing Data

18. The ILEC economists also claim that missing data from two sources – data on prices and data on the number of rivals – creates the potential for biasing the regression results toward finding an inverse relationship, which would be in a direction opposite to the bias I identified.

1. Missing Data on Prices

19. I agree with the ILEC economists that the locations with missing price data are not distributed randomly across regions or across providers. The regression results would be biased if the distribution of missing prices is correlated with the price level (with the direction of the bias depending on the direction of that correlation). To determine whether this possibility was the source of bias in my reported results, I estimated the primary specification on two subsamples: one limited to regions with relatively less missing price data, and one limited to **[BEGIN HIGHLY CONFIDENTIAL]** [redacted]

[END HIGHLY CONFIDENTIAL]. If this potential bias is important practically, regressions estimated on these subsamples would be expected to reduce it.[25] Yet I found no indication in the results of a bias from missing prices toward finding an inverse relationship.[26] There may not have been any bias resulting from missing price data, and if there was, it reinforced the direction of the bias I identified.[27]

20. The ILEC economists now say the fact that I detected a possible bias in the *same* direction as the bias I identified makes the reported results unreliable as a basis for policy-making.[28] I disagree. As emphasized above, it is appropriate to account for the bias against finding an inverse relationship between the number of rivals and price when interpreting the coefficients and drawing conclusions relevant to policy-making.

2. Missing Data on the Number of Rivals

21. The ILEC economists previously contended that I systematically undercounted the number of rivals because I excluded all connections

[25] The ILEC economists also observe that CenturyLink locations are heavily represented in the subsample of providers reporting relatively complete price data, and that "CenturyLink's territory differs from that of other major ILECs, being more rural and sparsely populated". ILEC Economists Supp. Reply Decl. ¶ 33. This difference is accounted for in my regression equations through location fixed effects.

[26] Baker Supp. Reply Decl. ¶ 16.

[27] This test would fail to identify a bias created by missing data toward finding an inverse relationship (the possible bias that concerns the ILEC economists) if the bias against finding an inverse relationship (the bias I identified) is more important in the two subsamples than in the sample as a whole, and, coincidentally, the two opposing magnitudes were similar in absolute value so cancelled each other out. This possibility is too implausible to credit.

[28] ILEC Economists Supp. Reply Decl. ¶ 35.

supplied by cable companies. They now accept, as I explained in my previous declaration,[29] that cable connections used for dedicated services are reported in the Special Access Data and that I included those connections in my statistical analysis. In their latest declaration, the ILEC economists say that two types of broadband connections not reported in the Special Access Data should have been accounted for in my analysis but were not: fiber connections that appear on the National Broadband Map but were not reported in the Special Access Data, and non-fiber cable connections that could be used to provide special access services.[30] Because I do not account for these broadband connections, they say, my regressions systematically understate the number of rivals at or near any

[29] Baker Supp. Reply Decl. ¶ 17.

[30] In addition, the ILEC economists say that I should have included cable connections over Ethernet with Service Level Agreements (SLA). ILEC Economists Supp. Reply Decl. ¶ 41. *Cf.* Letter from Matthew A. Brill to Marlene H. Dortch, Secretary, FCC, WCC Docket No. 05-25 3 (Mar. 25, 2016) (Comcast *Ex Parte* Notice) (indicating that Comcast offers Ethernet service with SLAs over hybrid fiber-coaxial connections and fiber facilities). Hybrid fiber-coaxial Ethernet connections with SLAs comparable with what the ILECs offer **[BEGIN HIGHLY CONFIDENTIAL]** [redacted] **[END HIGHLY CONFIDENTIAL]** were not available during 2013, the year covered by the FCC's data collection, so their exclusion or inclusion would not affect my reported regression results. Fiber Ethernet connections used for dedicated services were not excluded: they are reported in the Special Access data, and used in my regressions to identify both in-building and nearby rivals. Moreover, the results of regressions with ILEC prices as the dependent variable (which are most of the reported regressions), are not biased by the exclusion of Verizon's FiOS connections, which appear to account for a substantial fraction of the omitted fiber connections. Every dedicated service location served by FiOS is already served by the ILEC that owns the FiOS connection (usually Verizon but in some cases Frontier), so the availability or absence of a FiOS connection to those locations does not affect the count of in-building or nearby rivals (or affect the measurement of any other independent variable in the regressions).

location.[31] This claim appears to be the basis for an implicit argument that my regression results are unreliable and biased.[32]

22. None of the omitted connections, including fiber connections, are used to provide dedicated services. Many are likely used to provide services to residences, which are not locations where dedicated services would be purchased, and best efforts broadband, which is not a substitute for dedicated services. The rest were not used to provide dedicated services in 2013; otherwise, they would have been reported as such. Even if these connections served businesses that demand dedicated services, it was not profitable to convert them to do so (accounting for fixed costs of conversion and opportunity costs associated with shifting the connections from their current use) at the dedicated services prices that the cable providers would have received. It is likely that those connections vary in their conversion costs, and that, in consequence, many would not be profitable to convert to dedicated services even if dedicated services prices were somewhat higher. Accordingly, at least a substantial fraction of the omitted connections did not create competition for firms providing dedicated services.[33] Whether the firms accounting for the remaining connections should be considered rapid entrants (and thus market

[31] ILEC Economists Supp. Reply Decl. ¶ 36.

[32] They do not say this in their latest declaration but did so explicitly in their previous declaration. ILEC Economic Reply Comments ¶ 33.

[33] Baker Decl. ¶ 36.

participants) or considered potential entrants depends on the magnitude of the sunk conversion costs and the time required for conversion.[34]

23. Even if an omitted connection could have been a source of competition for firms providing dedicated services, that possibility would not necessarily affect my regression results. The concern would be that my measures of the number of rivals (nearby or in-building) would understate the actual number. That would not necessarily happen. If a firm owning an omitted connection is a potential entrant (rather than a market participant), my measures of rivalry would not be incorrect if the firm is already counted as a nearby provider (as it would be if it offered dedicated services near the customer location). If the firm owning the omitted connection is a market participant, my measures of rivalry would not be incorrect if the firm is already counted as a market participant (as it would be if it offered dedicated services in the same building as the customer location).

24. An empirical test shows that the regression results I presented were not biased, and instead are robust to accounting for omitted connections. Four additional independent variables were added to the primary specification to account for connections that appear on the National Broadband Map within the same census block as a customer location but were not identified as in-building or nearby dedicated services connections in the variables used in the regression results reported in my original

[34] The ILEC economists did not attempt to analyze the magnitude of the sunk conversion costs or the time required for conversion. They instead assume without justification that all the omitted connections are competitive alternatives for dedicated services connections.

specification.[35] Including these variables made little difference to the coefficients for in-building or nearby providers.[36]

C. Estimation Results from Price Cap Regions

25. In addition to their arguments about the consequences of the endogeneity of entry and missing data, the ILEC economists suggest that the results of one of the regressions I discuss in my initial declaration – estimation of the primary specification for a subsample limited to locations in price cap regions – demonstrate that the overall bias is toward finding an inverse relationship between the number of rivals and prices, which is opposite in direction to the bias I identify.

26. Their argument turns on their assumption that there can be no "meaningful empirical relationship between ILEC pricing and the number of competitive providers" in regions where ILEC prices are constrained by price caps.[37] (In those areas, the ILECs have not been given Phase I or Phase II regulatory flexibility. The ILEC economists appear to presume that this means that ILEC retail prices must be identical across all customers within price cap zones, or nearly so.) Based on that assumption, they interpret the fact that I find an inverse relationship when

[35] The four dummy variables indicate the number of omitted National Broadband Map connections in the census block of each location (one, two, three, or four or more).

[36] The sample was slightly different from that used in the results reported in my original declaration, because it incorporates minor data updates by the FCC since the date of that declaration. All of the additional variables entered significantly, one with a positive sign. Their cumulative effect was to reduce ILEC retail prices by 1.48%.

[37] ILEC Economists Supp. Reply Decl. ¶ 26.

estimating my primary specification on a subsample limited to price cap regions as showing that the regression results must be biased toward finding an inverse relationship.

27. The assumption underlying the ILEC economists' argument that ILEC retail prices do not vary in price cap regions is incorrect. A substantial fraction of prices in those regions are not constrained by price caps, for three reasons. First, the price caps do not apply to all dedicated services; many large ILECs offer Ethernet services outside of price caps. Second, ILECs have an incentive to market their term discount plans to large retail customers in response to CLEC competition. In the Special Access Data, more than one fourth of ILEC retail connections in price cap areas (26%) were sold through term discount plans. Third, even where price caps apply, an ILEC may have the ability to lower prices in response to potential or actual CLEC entry by reengineering circuits to reduce channel mileage charges. Because prices can and do vary within price cap regions, the inverse relationship between the number of rivals and prices that appears when the primary specification is estimated on a price cap region sample is not a test of the direction of the bias in the regression results.

C. Interpreting Regression Coefficients

28. For the reasons set forth above, the arguments presented by the ILEC economists do not lead me to alter my view that the estimated regression coefficients are likely biased against finding an inverse

relationship between the number of rivals and price. The regression results presented or discussed in my initial declaration provide lower bound estimates of the price-depressing effects of additional in-building or nearby providers.

III. Other Statistical Issues

29. This section addresses briefly four additional statistical issues raised by the ILEC Economists.

A. Statistical Significance of Cumulative Effects

30. First, I agree with the ILEC economists that it is possible as a matter of statistical theory that estimates of cumulative effects (derived from summing coefficient estimates of marginal effects) could be insignificant statistically even when some or all of the individual coefficients that are summed are significant statistically. This did not happen with the primary specification or with most of the regression results presented or discussed in my initial declaration, however.[38]

B. Large Sample Size

31. Second, I agree with the ILEC economists that in general, the statistical significance of regression coefficients tends to increase as the

[38] The F-test employed for this purpose has more power than the Bonferroni test the ILEC economists used because it accounts for the possibility of concern to the ILEC economists that correlations among explanatory variables could amplify standard errors on estimated average effects. *See* ILEC Economists Supp. Reply Decl. ¶ 13.

sample size increases.[39] But the ILEC economists are wrong to suggest that this means that my regression results are meaningless unless most coefficients are significant statistically, given the large sample.[40] Before explaining why, I note that this critique, even if correct, would not apply to my regression results. The vast majority of coefficients in all my specifications are significant statistically. For example, 47 of the 54 estimated coefficients in my primary specification (most of which are not reported in Table 2 of my initial declaration) are significant statistically, and the majority of coefficients that are reported are significant statistically.

32. Notwithstanding the sample size, my regression results would not be meaningless even if a substantial fraction of coefficients were not significant statistically because point estimates of the coefficients of variables accounting for rivalry are biased away from identifying an inverse relationship between the number of rivals and prices. This bias could make some coefficients small in absolute magnitude when their true value is larger, making them appear insignificant when they are different from zero.[41]

[39] ILEC Economists Supp. Reply Decl. ¶ 15 n 21.

[40] ILEC Economists Supp. Reply Decl. ¶ 15.

[41] The ILEC economists' assertion that the absence of a statistically-significant reduced form relationship suggests that a causal relationship is unlikely (see ILEC Economists Supp. Reply Decl. ¶ 20) is similarly predicated on assuming that the estimated relationships are unbiased.

C. Robustness Tests

33. Third, I properly described my use of clustered standard errors as a basis for testing the robustness of the inference that the relationship between the number of rivals and prices is inverse, contrary to what the ILEC economists say.[42] If all of the negative coefficients on variables accounting for rivals in the primary specification became insignificant when significance was tested with clustered standard errors, for example, or if the cumulative effects became insignificant, the results could be interpreted as failing that robustness test. (The primary specification did not fail this robustness test.) It is more common to test robustness of results to alternative specifications – as I also did[43] – but this test as well is appropriately described as a robustness test.[44]

D. Number of Rivals Needed for Competitive Prices

[42] ILEC Economists Supp. Reply Decl. ¶ 18.

[43] For example, I tested robustness of the results to using zip code fixed effects (rather than census tract fixed effects) to account for customer location, and to measuring bandwidth in different ways.

[44] The ILEC economists propose testing robustness by excluding the variables accounting for nearby competitors and comparing those results to the results of regressions including those variables. ILEC Economists Supp. Reply Decl. ¶ 18. It is difficult to understand what would be learned from purposely misspecifying the estimated equation by excluding variables that should be included on both theoretical and empirical grounds. (They appear to be proposing this as a robustness test, not as a basis for testing the joint statistical significance of the coefficients on the variables accounting for nearby rivals.) The ILEC economists did not follow through by implementing empirically this proposed test, nor by implementing any other empirical proposal in their declaration. Although they claimed it was impossible for them to implement one such proposal because they were unable to recreate the price variable I employed (see ILEC Economists Supp. Reply Decl. ¶ 48), that would not have prevented them from doing so using a price variable they constructed. The ILEC economists had access to the same data and had as much time to analyze it as my team.

34. Fourth, my observation that the regression results do not establish how many rivals are necessary to achieve competitive prices in the typical retail market should not be misinterpreted. The regression results establish that prices decline as the number of rivals increases. Because of the bias I identify, the estimated coefficients will tend to be upper bound estimates (less negative than the true values). Hence the cumulative effect of four or more in-building providers may exceed the 12.35% reduction in price indicated by the primary specification.[45] In addition, the regressions more reliably estimate the cumulative effect than they estimate how that effect is allocated across marginal in-building providers. For these reasons, the regression results should NOT be interpreted as saying that each incremental in-building rival to the ILEC short of four contributes little to the cumulative ILEC retail price reduction. Rather, the identification of an inverse relationship between the number of rivals and prices in the data is consistent with what economic theory generally predicts: an ILEC monopolist would be expected to reduce its retail prices with the entry of *each* incremental CLEC rival.[46]

IV. Competition from Nearby Rivals

[45] For this reason, the reported result does not establish that ILEC monopolists charge retail prices that exceed competitive prices by 12.35% on average. The monopoly markup could be greater.

[46] As discussed below in Section IV, two firms (or one firm and a potential entrant) are not sufficient for dedicated services markets to be competitive. Hence, in the typical market, the duopoly price would be expected to exceed the competitive price and an ILEC would be expected to reduce its retail price with the entry of additional CLECs beyond the first to compete with it. The empirical results are not inconsistent with this expectation.

35. In their latest declaration, the ILEC economists reaffirm two claims with which I disagree. First, they appear to continue to argue that two firms are sufficient to assure competitive outcomes in dedicated services markets.[47] Second, they assert that nearby providers are actual competitors in dedicated services markets,[48] not potential competitors (as I describe them).[49] Given the ILEC economists' contention that 99% of business establishments are located in census blocks where at least one nearby provider can be found,[50] these two claims add up to an assertion that virtually all dedicated services markets are competitive, notwithstanding that nationwide, according to the Special Access Data, 77.3% of buildings have a single in-building provider (almost always an ILEC), and almost all of the rest (20.8%) have only two in-building providers.[51]

36. As I have explained previously, the first ILEC claim is incorrect: two firms (or one firm and a potential entrant) are not sufficient for dedicated services markets to be competitive.[52] That is the prediction of

[47] They say they did not conclude this based "solely" on characterizing these markets as bidding markets. ILEC Economists Supp. Reply Decl. ¶ 50. This formulation seems to endorse the view that two firms are sufficient for competition in these markets, while disputing one possible description of their justification.

[48] ILEC Economists Supp. Reply Decl. ¶ 51.

[49] ILEC Economists Supp. Reply Decl. ¶ 51.

[50] Mark Israel, Daniel Rubinfeld & Glenn Woroch, Competitive Analysis of the FCC's Special Access Data Collection (Jan. 26, 2016) (attached to Letter from Glenn Woroch to Marlene H. Dortch, Secretary, FCC, WCC Docket No. 05-25 (Jan. 27, 2016) (ILEC Economic Comments) at 21.

[51] Baker Decl. ¶¶ 44-45.

[52] Baker Decl. ¶¶ 48-50.

most common oligopoly models, and the implication of the common finding of within-industry empirical studies is that greater concentration leads to higher prices.[53] It is also the implication of the observation that many CLECs experience substantial impediments to expanding output in dedicated services markets, including high marginal costs of serving another customer in a building, and the implication of the inverse relationship between the number of rivals and prices in dedicated services markets that emerges from the statistical analysis of the Special Access Data.

37. The ILEC economists' second assertion, that nearby providers are usually, if not invariably, actual competitors (not potential competitors) in dedicated services markets, is also incorrect. The ILEC economists contend that these firms are actual competitors because the firms have made sunk investments in facilities to nearby locations.[54] They err in ignoring the substantial *additional* sunk investments required for nearby rivals to serve a building's customers.

38. The ILEC economists appear to suppose that every nearby provider has invested in a fiber ring, and has built all possible laterals needed to serve other locations. In fact, to serve a new customer location, the nearby provider must almost always make additional sunk investments.[55] It must

[53] Baker Decl. ¶ 48.

[54] ILEC Economists Supp. Reply Decl. ¶ 51.

[55] Baker Decl. ¶ 97.

build a lateral and install electronics on the connection, and it may need to obtain a local construction permit and building access. These costs depend, among other things, on the length of the laterals built, the nature of the electronics added, whether the lines are buried, and local regulations (*e.g.,* a city may require replacement of cobblestones on scenic streets).

39. The sunk costs and delay associated with these additional investments mean that under the standards of the Horizontal Merger Guidelines, which both the ILEC economists and I reference, nearby providers are generally potential entrants, not market participants.[56]

40. Because two firms are not sufficient to assure competitive outcomes in dedicated services markets, and nearby providers are typically not participants (actual competitors) in dedicated services markets, there is no basis for supposing that dedicated services markets generally perform competitively.

V. Conclusion

41. For the reasons set forth above, nothing in the ILEC economists' latest declaration leads me to question the conclusion I reached in my initial report that ILECs likely exercise market power in most dedicated

[56] They are not "rapid entrants" (as the Merger Guidelines use the term), which may be seen as market participants (actual competitors). *See generally* Baker Decl. ¶¶ 39-40.

services markets and would be expected to charge prices above competitive levels unless prevented by regulation.

I declare under penalty of perjury that the foregoing is true and correct to the best of my information and belief.

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Jonathan B. Baker

Executed on April 21, 2016